

NONINVASIVE OPTICAL SENSOR FOR MEASURING NEAR INFRARED LIGHT ABSORBING ANALYTES

Stephen D. Walker, John E. Repine, Charles W. Henry, Harry L. Valenta, Jr.,
Peter E. Nelson, and R. Dale Zellers

ABSTRACT

An optical sensor includes an optical source capable of being positioned on a tissue and emitting near infrared light into the tissue at a plurality of selected wavelengths, and a photodetector capable of detecting reflected light from the tissue. The photodetector being positioned on the tissue removed from the optical source but sufficiently close in proximity to the optical source to contact the same general tissue. The optical sensor further includes an oscillator coupled to the optical source and capable of activating the optical source to emit the near infrared light, and a modulator coupled to the oscillator and capable of controlling radio frequency modulation of the optical source to emit a radio frequency component that is used to measure the optical path length and absorbance of an analyte of interest within the tissue.